

# Panasonic

ideas for life

Digital Signal Processing  
*CCD Color Micro-Camera Series*

Leading the pack for industrial camera image  
quality and operation



# The finest in high image quality and ease of use

This industrial camera series features a slim, compact body, definitive image technology and covers a broad spectrum of innovative applications from production line monitoring to specialized event videography. For the first time in the industry, the series makes use of a new CCD drive system and new easy-to-use image conversion functions resulting in higher image quality. Another high performance technology breakthrough by Panasonic.

## 3CCD Color Micro-Camera Series



1/2-type  
3CCD Color Camera Head  
**GP-US522HB**



Camera Control Unit  
**GP-US742CU**



1/3-type 3CCD Color Camera Head  
**GP-US732H** (Lens: optional)

- 1. Improved image quality by using the progressive system**

An industry first, the detachable CCD drive uses the progressive system. This drive creates a sharper image by eliminating flickering and increasing vertical resolution (GP-US732H).
- 2. High sensitivity and high resolution**

The GP-US522HB has over 800-line horizontal resolution, 5 lux minimum illumination, has a signal- to- noise ratio of 62 dB, and is equipped with a gamma correction function and 6-Axis color matrix control function, thus producing life-like sharp images.
- 3. Superior operation**

An easy to use on-screen menu allows for camera set-up and setting storing user selected parameters in two available scene files.

## CCD Color Micro-Camera Series



1/2-type CCD Color Camera Head  
**GP-KS822H** (Lens: optional)



Camera Control Unit  
**GP-KS822CU**

- 1. Equipped with mirror, rotation and freeze-image functions**

The mirror function permits right to left image reversal. The rotation function permits moving the image up and down. This camera series is also equipped with a freeze-image function for image verification is designed with user convenience in mind and operation functionality.
- 2. Super compact and ultra-light weight**

1/2-type CCD Color Camera Head GP-KS822H: weight, only 14 g\* diameter, 17 mm length, 35.5 mm.

\* Excluding lens
- 3. Multiple adjustment functions**

In addition to White Balance, AGC and ELC, the camera allows for multiple exposure settings for wide variety of lighting conditions.

### Applications

Research equipment	• Microscopy for biological research
Production lines	• Production line monitoring
Special event videography	• Aerial videography, sporting events, etc.
Medical Equipment*	• Endoscope cameras   • Retinal cameras   • Dental cameras

\*These products do not have medical standards approvals.

## Unprecedented Image Quality

The industry's first progressive remote head camera (GP-US732H) adds sharper flicker free performance while continuing to maintain superior sensitivity, signal-to-noise ratio, horizontal resolution and color reproduction capability.

### High image quality, sensitivity, and signal-to-noise ratio

#### Progressive Benefits

##### Uses the progressive system for the first time in the industry for remote head cameras Sharp images realized with no flickering

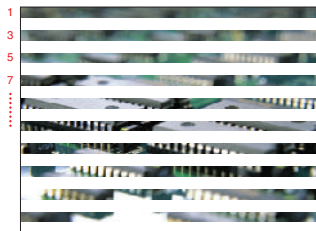
For the first time in the industry, GP-US732H uses the progressive system with a separate camera head and control unit. The progressive system accomplishes the scanning in one frame compared to interlace scanning which divides video images into even and odd fields. The resulting image is sharper with less flickering, making this an ideal camera for use as a microscope camera for research.

It is possible to switch the interlace and progressive systems when necessary, using the progressive system for capturing moving images or using the interlace system where extra sensitivity is required.

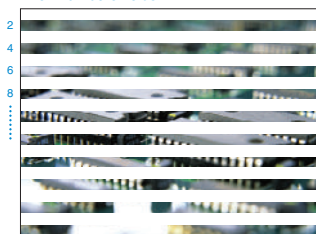
#### Interlace system

Video imaging\* by scanning odd and even fields. Excellent for still images or subjects with little movement.

#### Odd numbers fields

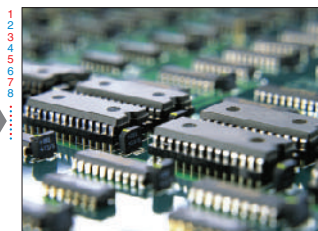


#### Even numbers fields



#### Progressive system

Video imaging a scene by scanning once. Vertical Resolution is twice that of Interlace system\*. This system is best for motion video because there is less flickering.



\* PAL: 25 frames, 50 fields  
NTSC: 30 frames, 60 fields

[Video image results are clearly shown in these image pictures.]

#### High Sensitivity, Clear images of Dark Areas

Both GP-US522HB and GP-US732H have high sensitivity level. With sensitivity of F16 (2,000 lux), GP-US522HB can capture a scene with minimum illumination reduced to 5 lux. These new cameras produce clear images in low light condition.

#### S/N (signal-to noise) Ratio of over 62 dB for Better Picture Quality

The 3CCD Micro Camera Series has a high signal-to-noise ratio of over 62 dB.

#### Life-like Color reproduction

##### Gamma Correction, Improved Dynamic Range

The set-up menu includes the gamma correction function. You can select optimum contrast settings for both bright and dark areas. This function prevents blurring and thus provides a clearer picture even in bright or dark areas.

##### 6-Axis Color Matrix Control Function-Reproduction of Life-like Colors

Each color can be adjusted separately without changing the white balance of the entire image. For red colors, very fine adjustment is available, which is particularly useful for biological research. With this function, you can make optimum color adjustments for various systems and applications.



Conventional image



GP-US522HB  
GP-US732H

#### High Resolution

##### Over 800-Line Horizontal Resolution

GP-US522HB: The 1/2-type 3CCD with super high sensitivity provides the best picture quality. Horizontal resolution is more than 800 lines. The GP-US732H using a 1/3-type 3CCD has a horizontal resolution of 750 lines.

##### Improved Contour Correction

The high-band aperture function increases the resolution by amplifying the high frequency. You can make horizontal and vertical contour adjustments separately to ensure clear images.

##### Red Enhancement

By switching the RED DTL in the set-up menu to ON, you can enhance red colors only; other details are adjusted as usual. Red colors are reproduced with high resolution. This function is particularly useful for biological research.



Conventional image



GP-US522HB  
GP-US732H





1/3-type 3CCD Color Camera Head  
**GP-US732H**



Camera Control Unit  
**GP-US742CU**

1/2-type 3CCD Color Camera Head  
**GP-US522HB**

## Full-feature, easy-to-use Camera Control Unit

### Flexible Camera Adjustment, Optimum Setting

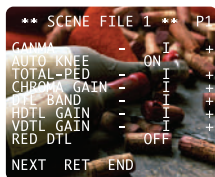
#### On-Screen Menu Simplifies Set-up of Highly Advanced Functions

The on-screen menu facilitates simple and efficient adjustments. You can make these adjustments while observing the image. A list of camera functions are displayed on the monitor screen. Simply select the appropriate presets and press the corresponding buttons to complete the setting of the Color Matrix Control, Red Enhancement, Gamma Correction and many other highly advanced functions.



#### Scene File Function Stores and Recalls Setting Information

The memory can store up to two different scene files containing the settings you have established in the on-screen menu. For example, you can store the setting for imaging bright subjects as Scene 1, the setting for imaging dark subjects as Scene 2 and either can be called up when needed.



#### Sensing Area Selection to Ensure Correct Exposures

You can select a sensing area from five presets: ALL, CENTER, CIRCLE (Small), CIRCLE (Medium) and CIRCLE (Large), when AGC or ELC is selected. Otherwise, it can be set for automatic or manual operation. This function is effective for microscopy or situations when you cannot illuminate the subject area uniformly.

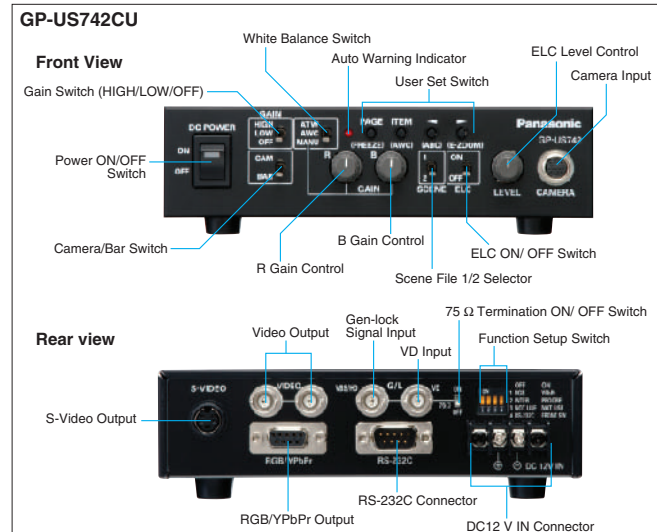
#### 2-Dimensional Low-Pass Filter to Control Moire

The set-up menu includes a 2D Low-Pass Filter. You can turn this function ON or OFF from the menu. The 2D Low-Pass Filter prevents moire and improves image clarity.

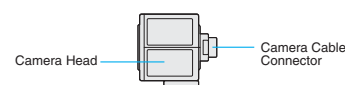
#### Other Functions

Synchro-Scan adjusts the shutter timing for synchronization with a computer display. Electronic Shutter (7 steps between 1/100 (PAL : 1/120) sec and 1/10,000 sec) or auto ELC (Electric Light Control) Function. Other functions include the freeze-image capturing function and 2.5 x electronic zoom function. Even when the subject is moving, the progressive system produces a high resolution image that is free of blurring.

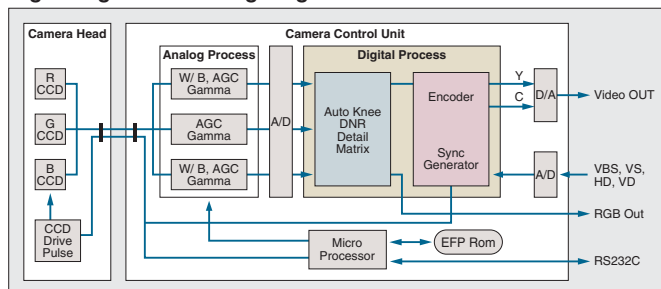
#### Major Operating Control & Switches



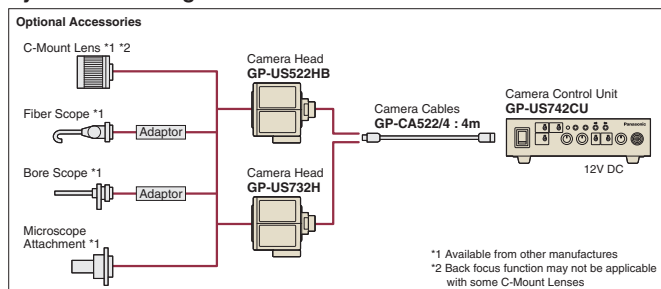
#### GP-US522HB / GP-US732H



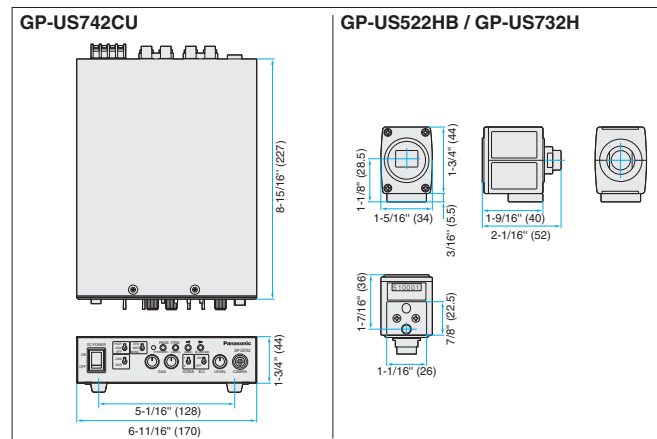
#### Digital Signal Processing Diagram



#### System Block Diagram



#### Dimensions



# CCD Color Micro-Camera Series

## Super Compact and High Performance

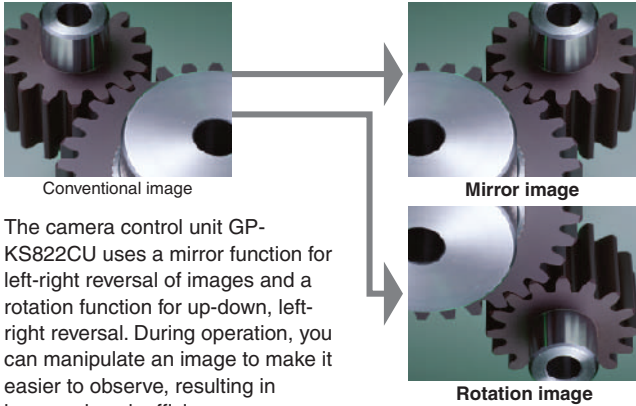
The 1/2-type CCD Color Camera Head GP-KS822H, weighing 14 g (excluding lens) and is capable of 480-line horizontal resolution. It's equipped with a new function for rotating and reversing images in the camera control unit GP-KS822CU.



Camera Control Unit  
GP-KS822CU

1/2-type CCD Color Camera Head  
GP-KS822H (Lens: optional)

### Equipped with Mirror and Rotation Functions The angle of live images can be altered to make them easier to observe.



The camera control unit GP-KS822CU uses a mirror function for left-right reversal of images and a rotation function for up-down, left-right reversal. During operation, you can manipulate an image to make it easier to observe, resulting in improved work efficiency.

### Equipped with Freeze-Image Function

When necessary, you can freeze moving images in order to confirm details.

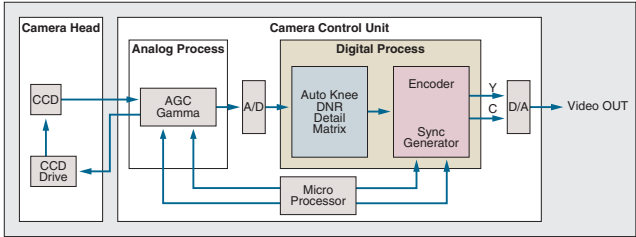
### Quality Engineering Features

- 1/2-type Interline Transfer CCD with 752(H) x 582(V) pixels at PAL, 768(H) x 494(V) at NTSC.
- 480-line horizontal resolution
- 50 dB signal-to-noise ratio
- Min. illumination: 6 lux at F 1.4
- Full compatibility between camera head and CCU

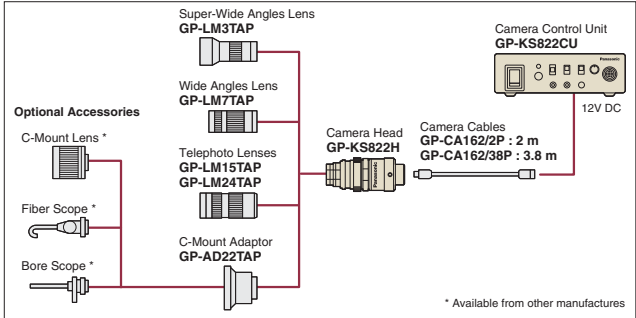
### Details may be adjusted using AWC/ATW

For your specific requirements, Camera Control Unit GP-KS822CU facilitates detailed color adjustment by engaging Auto White Control (AWC) or Auto Tracing White (ATW) balance.

### Digital Signal Processing Diagram



### System Block Diagram



### Sensing Area Selection (AGC/ELC)

The Camera Control Unit GP-KS822CU features a Sensing Area Selection function. This function has four image sensing patterns: ALL, small, wide and auto detection.

### Versatile output signals: composite x 2, Y/C x 1

To avoid cross color, the Camera Control Unit GP-KS822CU features Y/C (S-Video) output which produces well-balanced colors.

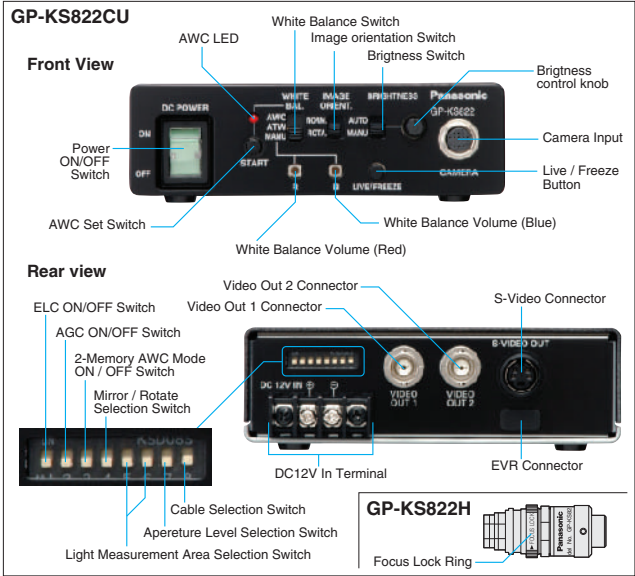
### Cable length

Cable length between Camera Head GP-KS822H and Camera Control Unit GP-KS822CU with optional cables:  
GP-CA162/2P : 2 m, GP-CA162/38P : 3.8 m

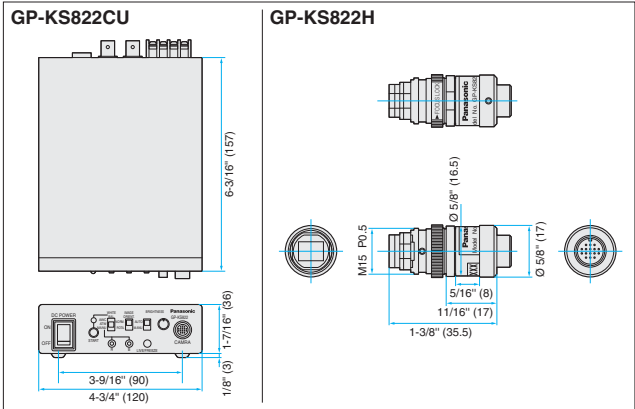
### Other Functions

The Brightness Control maintains a constant video signal level by automatically controlling AGC and ELC functions. ELC function continuously controls light coming into the CCD. AGC, reliable single-board designed CCU, easy key access, 2 memory AWC, Aperture level selection, and manual White Balance.

### Major Operating Control & Switches



### Dimensions



SPECIFICATIONS

TV System		PAL			NTSC		
Model No.	Control Unit	GP-US742CUE		GP-KS822CUE	GP-US742CUP		GP-KS822CUP
	Camera Head	GP-US522HBE	GP-US732HE	GP-KS822HE	GP-US522HBP	GP-US732HP	GP-KS822HP
Pick-up System		Micro prism system			Micro prism system		
Pick-up Device		752 (H) x 582 (V) Three 1/2-type interline transfer (IT) super high sensitivity CCDs	753 (H) x 582 (V) Three 1/3-type interline transfer (IT) super high sensitivity CCDs	752 (H) x 582 (V) 1/2-type interline transfer (IT) super high sensitivity CCDs	768 (H) x 494 (V) Three 1/2-type interline transfer (IT) super high sensitivity CCDs	771 (H) x 492 (V) Three 1/3-type interline transfer (IT) super high sensitivity CCDs	768(H) x 494 (V) 1/2-type interline transfer (IT) super high sensitivity CCDs
Scanning System		625 lines/ 50 fields/ 25 frames	625 lines/ 50 frames (Progressive drive) 625 lines/ 50 fields/ 25 frames (Interlace drive)	625 lines/ 50 fields/ 25 frames	525 lines/ 60 fields/ 30 frames	525 lines/ 60 frames (Progressive drive) 525 lines/ 60 fields/ 30 frames (Interlace drive)	525 lines/ 60 fields/ 30 frames
Synchronizing System		Internal or External (Gen-Lock), automatically switchable Internal: CCIR standard External (Gen-Lock) Input: VBS, VS, HD/VD is selectable SC Phase for Gen-Lock (VBS): Free adjustable over 360° H Phase for Gen-Lock (VBS, VS): Adjustable			Internal or External (Gen-Lock), automatically switchable Internal: EIA standard External (Gen-Lock) Input: VBS, VS, HD/VD is selectable SC Phase for Gen-Lock (VBS): Free adjustable over 360° H Phase for Gen-Lock (VBS, VS): Adjustable		
Video Outputs	VBS: 1.0 V [P-P] Composite signal level/ 75 Ω						
	Video 1,2	Y: 0.7 V [P-P] Luminance level/ 75 Ω C: 0.3 V [P-P] Burst level/ 75 Ω			Y: 0.714 V [P-P] Luminance level/75 Ω C: 0.286 V [P-P] Burst level/75 Ω		
	RGB/ YPbPr	R,G,B: 0.7 V [P-P] each/ 75 Ω Y: 0.7 V [P-P] Luminance level/ 75 Ω PbPr: 0.525 V [P-P] each/ 75 Ω SYNC: 0.3 V [P-P] Sync level/ 75 Ω			R,G,B: 0.7 V [P-P] each/75 Ω Y: 0.7 V [P-P] Luminance level/ 75 Ω PbPr: 0.525 V [P-P] each/ 75 Ω SYNC: 0.3 V [P-P] Sync level/75 Ω		
Required Illumination		2000 lux at F16, 3200 K	2000 lux at F13, 3200 K (Interlace drive) 2000 lux at F 9, 3200 K (Progressive drive)	—	2000 lux at F16, 3200 K	2000 lux at F13, 3200 K (Interlace drive) 2000 lux at F 9, 3200 K (Progressive drive)	—
Minimum Illumination		5 lux (0.5 foot candle) at F2.8 with +12 dB gain without Sensitivity Up, 30 % level at center	7 lux (0.7 foot candle) at F 2.8 with +12 dB gain without Sensitivity Up, 30 % level at center (Interlace drive) 14 lux (1.4 foot candle) at F2.8 with +12 dB gain 30 % level at center (Progressive drive)	6 lux at F1.4	5 lux (0.5 foot candle) at F2.8 with +12 dB gain without Sensitivity Up, 30 % level at center	7 lux (0.7 foot candle) at F2.8 with +12 dB gain without Sensitivity Up, 30 % level at center (Interlace drive) 14 lux (1.4 foot candle) at F2.8 with +12 dB gain 30 % level at center (Progressive drive)	6 lux at F1.4
Signal-to-Noise Ratio		62 dB (Typical, Y signal without Gain up, Enhance and Gamma)			62 dB (Typical, Y signal without Gain up, Enhance and Gamma)		
Horizontal Resolution		800 lines at center (Y signal)	750 lines at center (Y signal)	480 lines or more at center	800 lines at center (Y signal)	750 lines at center (Y signal)	480 lines or more at center
White Balance		ATW (Automatic Tracing White Balance Control), AWC (Automatic White Balance Control) and Manual					
Black Balance		ABC (Automatic Black Balance) and Manual			ABC (Automatic Black Balance) and Manual		
Color Bar		EBU color bar with 0 % set-up			SMPTE color bar with 7.5 % set-up		
Electronic Shutter:		AUTO: 1/50 - 1/10000s STEP: Selectable 1/50(OFF),1/120, 1/250, 1/500, 1/1000, 1/2000,1/4000 and 1/10000s			AUTO: Adjustable between 1/60 - 1/10000s STEP: Selectable 1/60(OFF),1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000 and 1/10000s		
Gain Selection		AGC and Gain Up (Selectable)			AGC and Gain Up (Selectable)		
Controls		R Gain, B Gain and Brightness LEVEL			R Gain, B Gain and Brightness LEVEL		
Computer Interface		RS-232C: D-SUB 9-pin Connector x 1			RS-232C: D-SUB 9-pin Connector x 1		
Lens Mount		Special C-Mount	C-Mount	C-Mount (with Optional C-Mount adaptor) or Optional lens	Special C-Mount	C-Mount	C-Mount (with Optional C-Mount adaptor) or Optional lens
Power Source		12 V DC			12 V DC		
Power Consumption		12 W			12 W		
Ambient Operating Temperature		0 °C ~ 45 °C			0 °C ~ 45 °C		
Ambient Operating Humidity		30 % ~ 90 %			30 % ~ 90 %		
Dimensions	Camera Head (Excluding Mounting Adaptor)	34 (W) x 44 (H) x 52 (D) mm			1-5/16" (W) x 1-11/16" (H) x 2" (D)		
	CCU (Excluding Rubber Foot and Connector)	170 (W) x 44 (H) x 227 (D) mm			6-45/64" (W) x 1-11/16" (H) x 8-15/16" (D)		
Weights (Approx)	Camera Head (Excluding lens)	110 g {0.24 lbs}			110 g {0.24 lbs}		
	CCU	1.2 kg {2.64 lbs}			1.2 kg {2.64 lbs}		

Optional Accessories

Camera Cables

3CCD Color Micro-Camera Series

GP-CA522/4 : 4 m



CCD Color Micro-Camera Series

GP-CA162/2P : 2 m  
GP-CA162/38P : 3.8 m



Wide line-up optical lenses

CCD Color Micro-Camera Series

<p>Super-Wide Angles Lens GP-LM3TAP</p> 	<p>Wide Angles Lens GP-LM7TAP</p> 	<p>Telephoto Lenses GP-LM15TAP GP-LM24TAP</p> 	<p>C-Mount Adaptor GP-AD22TAP</p> 
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An optical C-Mount adaptor GP-AD22TA enables use with C-Mount lenses.

- All TV pictures and menu are simulated and shown for the purpose of explanation.
- Weights and dimensions are approximate.
- Specifications are subject to change without notice.
- These products may be subject to export control regulations.

**Important** — Safety Precaution: carefully read the operating instructions and installation manual before using this product.

Panasonic is registered with “ISO 14001,” the international standard for the environment. To ensure a bright future for the earth, Panasonic has begun numerous activities to promote clean global manufacturing.

<div><p><b>Panasonic</b></p><p><b>Panasonic System Solutions Company</b> Unit Company of Panasonic Corporation of North America</p><p>Medical Vision 3 Panasonic Way 2H-2 Secaucus, New Jersey 07094 1-888-880-8474 http://www.panasonic.com/visionsystems</p><p><b>Panasonic System Solutions Company</b> <b>Matsushita Electric Industrial Co.,Ltd.</b></p><p>4-3-1,Tsunashima-higashi, Kohoku-ku, Yokohama, 223-8639, Japan Tel 81(0)45-544-3284 Fax 81(0)45-540-5773</p></div>	<p>DISTRIBUTED BY:</p>
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